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STANFORD UNIVERSITY SCHOOL OF MEDICINE

Department of Genetics

Instrumentation Research Laboratories

Elliott C. Levinthal, Director

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Dr. JM McCullough
Science Policy Research Division
Congressional Research Service
Library of Congress

Dear Dr. McCullough:

I was glad to have your letter of November 27 and the opportunity to comment on your supplemental report one on "Genetic Engineering-Evolution of the Technological Issue."

My most urgent recommendation to you is to see if there is some way in which this material might be held off until the holding of the International Conference at Asselamar in February. I really am very much concerned about the amount of inflammation that is being injected into this issue. I would not suggest holding off for very long, but I am sure that there will be a much more tempered presentation of the entire problem with the holding of the conference. I realize that you are not solely responsible for such such questions of timing but I thought I would stress this information to you.

My further comments have to do with items on particular pages and have to do mainly with some points of emphasis.

Page 4: About the definition of genetic engineering. What about the side effects of other social policies, or the lack thereof, that result in differential rates of reproduction of different genotype? For example, Alexander Graham Bell pointed out in the last century that special education for the deaf encourages intermarriage of the (sometimes genetically) deaf since they are uniquely ~~unable~~ able to communicate with one another by sign language.

Actually the first use I can find of the phrase genetic engineering was in fact rather broad.

Page 8: The recommended halt was an interim suspension. The expression "public health hazards of this research" may be confusing since so many people are ready to ring the alarm about the acquisition of new knowledge for which they believe the human race is as yet unprepared. This was certainly not the intention of the committee and I believe be stressed that it was possible side effects of the conduct of research not the acquisition of new knowledge that was within their concern.

Page 9? As I think I stressed to you before my own view is that pre-empted

See also, abortion

McCullough, J.H.

abortion far outweighs other corrective opportunities at the level of the gene. Of course we may find practical remedial or compensatory therapies that do not directly depend on the DNA sequence.

Page 10: I am enclosing a paper by Drs. Garamella which has been unfairly overlooked as having provided some of the most important conceptual inputs into the development of this final work.

Page 12: I have to say that the work that has been reported by Ledoux and others on effects of DNA on higher plants is still highly controversial. I am so far not aware of any single experiment that has been repeated in more than one laboratory.

Page 16: I must say to my own knowledge many members of the committee have had considerable misgivings over the manifest over-interpretation of their cautions.

Page 26: I trust that the conference will also go into the public health costs of overdamping of research and may also go into the comparable problems that face us in other areas of microbiology and even of international travel whose potentiality for imported new viruses impresses me as being a far graver hazard than laboratory investigation. (Have you seen a recent book "Fever" about the Lasa fever episode?) How will we ever defend ourselves against such natural hazards if there are severe impediments to laboratory research on these pathogens?

Page 29: At the foot of the page I really wonder about the "severe and adverse reaction which many peers had given". Is that really true? I know that there was a small amount of rather noisy reaction but I wonder if that is a fair characterization. As to the question of the continuation of research in relative secrecy this is an unfair allegation in view of the considerable efforts of Dr. Edwards had made for years in publicizing the opportunity and his intentions to proceed with these kinds of investigation. If what you have in mind is more publicity about individual cases I think we must save some concern for the privacy of the particular patients whose problems were at issue in the experimental efforts.

Page 37: About "alter course of human evolution" note my remarks vis-a-vis page 4.

Page 32: I am appalled at the thrust of much of the new legislation which threatens to single out experimentation as a crime per se without regard to the material acts that such experimentation comprises. In California today, under the laws concerning research on fetal material, it is evident that procedures on a fetus that are dedicated to the acquisition of new knowledge have been singled out in just that fashion while there are essentially no restraints with respect to other manipulations of the fetus--nor are there likely to be under the ruling of the Supreme Court. What an ugly paradox!

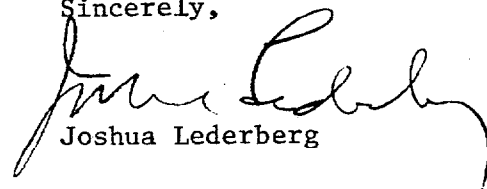


I hope it will be possible to emphasize that it is just in the area of the engineering of DNA molecules and their insertion into microbes and into plants that the payoff is just beginning to appear for the practical application of studies on molecular genetics. We face crushing problems on the area of efficient production of food, in the utilization of energy and the extraction of mineral resources and it takes little imagination to see what an important impact there could be in solving these problems by the application of carefully engineered microorganisms. I'm not suggesting that we approach these possibilities with such enthusiasm that we ignore the side effect hazards but I think it absolutely must be pointed out that we cannot dampen research in those areas without paying a very significant price in denied opportunities for the alleviation of other problems.

I believe you have had in mind the following points quite generally but I think they cannot have too much emphasis: the need to factor out, in considerations of the law and ethics of experimentation a number of very distinct issues:

- 1) Material side-effect hazards
- 2) the ethics of the experimental situation - as exemplified by abortion
- 3) the implied dangers of knowledge per ~~say~~ *se*
- 4) the needs for the regulation of the application of new technologies.

Sincerely,



Joshua Lederberg